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INCLUDING AN INDEX TO THE REPORTS OF THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES FROM THE FIRST TO THE TWENTY-FIRST, INCLUSIVE

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WEIGHTS AND MEASURES REFERENCES

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COMPILED BY
RALPH W. SMITH, Senior Engineer

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FOREWORD

The material in this publication has been compiled for the purpose of assembling, in form convenient for use, references to published material relating to the subject of weights and measures standards and administration. Officials of the States and cities engaged in enforcing weights and measures laws, manufacturers of commercial weighing and measuring apparatus, and students of the weights and measures history of the United States will find the references given herein of material assistance in their respective fields of endeavor.

The references are divided into four main groups. In the first are listed various publications of the National Bureau of Standards which relate to the subject of weights and measures in general or specific aspects; the list contains references to publications of the bureau which it is believed are most likely to interest weights and measures officials and manufacturers of weighing and measuring devices.

The second group of references is confined to the reports of the proceedings of the meetings of the National Conference on Weights and Measures, which constitute a valuable library of weights and measures information. Heretofore the material contained in these reports has not been indexed, and, in consequence, information given in the reports on a particular subject or by a particular speaker could not easily be located. To make this information more readily available, two forms of index have been prepared, the first arranged by subjects, and the second arranged by the names of speakers.

The subject index has been carefully cross indexed, in an effort to enable those using it to locate the desired information under principal or associated words. In the name index, the names of speakers are arranged alphabetically, and under each name appear, in chronological order, the papers or addresses presented to the conference by that speaker; in those instances in which a speaker's official or business connection has changed during the period covered by the conference reports, his name is entered once for each such connection, with appropriate listing of papers or addresses under each entry. These references will prove especially valuable to the weights and measures official, and to those desiring to trace the development of specifications and tolerances for commercial weighing and measuring devices.

The third group of references relates to weights and measures standards in the United States, and will be of particular interest to students desiring to consult original sources, and to others wishing to make a detailed study of the development of standards in this country.

The final group of references deals with books by outside authors, and periodicals on the subject of weights and measures. A considerable number of the book references have been included for the use of those wishing to inquire somewhat in detail into the development of modern systems of weights and measures, with particular reference to the history of such development in England, from whose standards the weights and measures in customary use in the United States are an outgrowth.

WEIGHTS AND MEASURES REFERENCES

Including an Index to the Reports of the National Conference on Weights and Measures from the First to the Twenty-first, Inclusive

PUBLICATIONS OF THE NATIONAL BUREAU OF STANDARDS RELATING TO THE SUBJECT OF WEIGHTS AND MEASURES

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Publications of the Bureau of Standards may be consulted at Government depository libraries located throughout the United States. A list of the names and locations of such libraries will be supplied free upon application to the Bureau of Standards.

A copy of Bureau of Standards Circular No. 24 with the latest supplement thereto, containing the titles and descriptive abstracts of all bureau publications, will be supplied free upon application to the Bureau of Standards.

Circulars of the Bureau of Standards are subject to revision to keep the subject matter current. In the case of circulars listed below, there are given the latest data available at the time this publication went to press. Before ordering circulars it will be advisable to consult the latest supplement to Circular No. 24, which will give information on the latest editions of all circulars.

Publications marked with an asterisk (*) are no longer available for purchase]

SCIENTIFIC PAPERS

Designation	Title	Date	Price
			Cents
*S1	Recomparison of the United States Prototype Meter, L. A. Fischer.	1904	------
*S17 [1]	History of the Standard Weights and Measures of the United States, L. A. Fischer.	1905	------
*S92	The Testing of Glass Volumetric Apparatus, N. S. Osborne and B. H. Veazey.	1908	------
*S215	Micrometer Microscopes, A. W. Gray	1913	------
S328	Variance of Measuring Instruments and Its Relation to Accuracy and Sensitivity, F. J. Schlink.	1918	5
S507	A New Interference Apparatus for Testing Hæmacytometers, C. G. Peters and B. L. Page.	1925	10
S527	Short Tests for Sets of Laboratory Weights, A. T. Pienkowsky.	1926	10
S534	Effect of Concentrated Loads on the Length of Measuring Tapes, L. V. Judson.	1926	10
S535	A Fundamental Basis for Measurements of Length, H. W. Bearce.	1926	5
S555	A Weight Burette for the Micromeasurement of Liquid Volumes, Martin Shepherd.	1927	5

[1] Superseded by M64.

TECHNOLOGIC PAPERS

Designation	Title	Date	Price
			Cents
*T9	The Density and Thermal Expansion of Linseed Oil and Turpentine, H. W. Bearce.	1912	------
*T77	Density and Thermal Expansion of American Petroleum Oils, H. W. Bearce and E. L. Peffer.	1916	------
T81	Liquid-Measuring Pumps, F. J. Schlink	1916	15
*T106	Stabilized-Platform Weighing Scale of Novel Design, F. J. Schlink.	1918	------
T114	A Portable Cubic-Foot Standard for Gas, M. H. Stillman.	1919	5
*T153	Area Measurement of Leather, F. J. Schlink	1920	------
T199	Method for Precision Test of Large-Capacity Scales, C. A. Briggs and E. D. Gordon.	1921	5
T208	Weighing by Substitution, C. A. Briggs and E. D. Gordon.	1922	5
T226	A Study of Commercial Dial Micrometers for Measuring the Thickness of Paper, P. L. Houston and D. R. Miller.	1922	10
T247	A New Electrical Telemeter, Burton McCollum and O. S. Peters.	1924	15

CIRCULARS

C1 (2d ed.)	National Bureau of Standards (organization, functions, etc.).	1925	50
*C2 (5th ed.)	Measurements of Length and Area, Including Thermal Expansion.	1915	------
C3 (3d ed.)	Design and Test of Standards of Mass	1918	15
*C4 (2d ed.)	Verification of Standards of Capacity	1905	------
*C5 (3d ed.)	Testing of Clinical Thermometers	1917	------
C8 (4th ed.)	Testing of Thermometers	1926	10
*C9 (8th ed.)	Testing of Glass Volumetric Apparatus	1916	------
C10 (4th ed.)	Legal Weights (in pounds) per Bushel of Various Commodities.	1924	5
C16 (5th ed.)	The Testing of Hydrometers	1922	5
C18 (2d ed.)	Standard Gage for Sheet and Plate Iron and Steel.	1911	5
C19 (6th ed.)	Standard Density and Volumetric Tables	1924	15
C20 (2d ed.)	Electrical Measuring Instruments	1915	15
C24 (7th ed.) [2]	Publications of the Bureau of Standards	1925	------
C24 (sup.) [2]	Supplementary List of the Publications of the Bureau of Standards.	1927	------
*C32 (4th ed.)	Standards for Gas Service	1920	------
C43 (2d ed.)	Jewelers' and Silversmiths' Weights and Measures.	1921	10
*C47 (1st ed.)	Units of Weight and Measure—Definitions and Tables of Equivalents.	1914	15
C47 (sup.) (1st ed.).	(Gives additional information similar in character to that contained in C47.)	1917	5
C51 (1st ed.)	Measurement of Time and Tests of Timepieces	1914	15
C55 (1st ed.)	Measurements for the Household	1915	45
*C57 (2d ed.) [3]	United States Standard Tables for Petroleum Oils	1916	------
*C59 (1st ed.)	United States Standard Baumé Hydrometer Scales.	1916	------
*C61 (1st ed.) [4]	Specifications and Tolerances for Weights and Measures and Weighing and Measuring Devices.	1920	------

[2] A copy of Circular 24 and/or a copy of the latest supplement thereto will be furnished free, upon request made to the Bureau of Standards, Washington, D. C.
[3] Superceded by C154 and supplement thereto.
[4] Superceded by M85.

CIRCULARS—Continued

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C64 (1st ed.) [5]	Rules and Regulations for Enforcement of Lime-Barrel Act.	1917	5
C67 (1st ed.)	Combined Table of Sizes in the Principal Wire Gages.	1918	5
C70 (1st ed.)	Materials for the Household	1917	50
C71 (1st ed.) [5]	Rules and Regulations Promulgated Under Authority of the Federal Standard Barrel Law.	1917	5
C77 (1st ed.)	Table of Unit Displacement of Commodities	1919	10
C83 (1st ed.)	Specifications for the Manufacture and Installation of Railroad Track Scales.	1920	5
C154 (1st ed.)	National Standard Petroleum Oil Tables	1924	30
C154 (sup.) (1st ed.).	(Abridged volume-correction table for petroleum oils.)	1925	5
C199 (1st ed.)	Specifications for Hand-Operated Grain-Hopper Scales.	1925	10
C309 (1st ed.)	Gas-Measuring Instruments	1926	40
C328 (1st ed.)	Testing of Measuring Tapes at the Bureau of Standards.	1927	10
C329 (1st ed.)	Calibration of a Divided Scale	1927	10
C332 (1st ed.)	Testing of Line Standards of Length	1927	10
C333 (1st ed.)	Specifications for the Manufacture and Installation of Two-Section Knife-Edge Railroad Track Scales.	1927	10
C371.[6] (1st ed.)	Alphabetical Index and Numerical List of U. S. Government Master Specifications, Promulgated by the Federal Specifications Board.	1928	------

MISCELLANEOUS PUBLICATIONS

*M1 [7]	Manual of Inspection and Information for Weights and Measures Officials.	1918	------
M2 (2d ed.)	The International Metric System of Weights and Measures.	1922	5
M3	The International Metric System (chart)	------	25
M4	Report of the First Annual Conference on Weights and Measures (1905).	------	10
M5	Report of the Second Annual Conference on Weights and Measures (1906).	------	15
M6	Report of the Third Annual Conference on Weights and Measures (1907).	------	25
M7	Report of the Fourth Annual Conference on Weights and Measures (1908).	------	15
M8	Report of the Fifth Annual Conference on Weights and Measures (1910).	------	15
*M9	Report of the Sixth Annual Conference on Weights and Measures (1911).	------	------
*M10	Report of the Seventh Annual Conference on Weights and Measures (1912).	------	------
*M11	Report of the Eighth Annual Conference on Weights and Measures (1913).	------	------
M12	Report of the Ninth Annual Conference on Weights and Measures (1914).	------	20
*M13	Report of the Tenth Annual Conference on Weights and Measures (1915).	------	------
M14	Report of the Eleventh Annual Conference on Weights and Measures (1916).	------	35
M20 (3d ed.)	Federal and State Laws Relating to Weights and Measures.	1926	230

[5] Reprinted in H11.
[6] Available free upon application to the Bureau of Standards.
[7] Superseded as follows: As to general information on weights and measures administration, by H11; as to specifications and tolerances for commercial weighing and measuring devices, by M85. Methods for testing commercial weighing and measuring devices will be treated in a future publication.

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M39 (3d ed.)	Household Weights and Measures (card)	1926	5
M41	Report of the Twelfth Annual Conference on Weights and Measures (1919).	------	20
M43	Report of the Thirteenth Annual Conference on Weights and Measures (1920).	------	20
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M48	Report of the Fourteenth Annual Conference on Weights and Measures (1921).	------	20
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M55	Report of the Sixteenth Annual Conference on Weights and Measures (1923).	------	30
M59	Report of the Seventeenth Annual Conference on Weights and Measures (1924).	------	35
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M70	Report of the Eighteenth National Conference on Weights and Measures (1925).	------	50
M74	Report of the Nineteenth National Conference on Weights and Measures (1926).	------	60
*M77	Standards Yearbook, 1927	------	------
M80	Report of the Twentieth National Conference on Weights and Measures (1927).	------	45
M83	Standards Yearbook, 1928	------	100
M85	Specifications and Tolerances for Commercial Weighing and Measuring Devices.	1929	50
M87	Report of the Twenty-first National Conference on Weights and Measures (1928).	------	35
M90	Directory of Commercial Testing and College Research Laboratories.	1929	15
M91	Standards Yearbook, 1929	------	100
M101	Report of the Twenty-second National Conference on Weights and Measures (1929).	------	30
M104	Testing Equipment for Large-capacity Scales, for the Use of Weights and Measures Officials.	1930	------

HANDBOOKS

*H1 [10]	Manual of Inspection and Information for Weights and Measures Officials.	1918	------
H11	Weights and Measures Administration	1927	70
M85	Specifications and Tolerances for Commercial Weighing and Measuring Devices.	1929	50

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R10	Milk and Cream Bottles and Bottle Caps (first revision, 1927).	------	5
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R20–28 (2d ed.)	Steel Barrels and Drums	1928	5
R25	Hot-Water Storage Tanks	1925	5
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[8] A reprint of a portion of C55.
[9] A reprint of the text of S17 to which have been added a "foreword" and 17 pages of illustrations.
[10] Superseded as follows: As to general information on weights and measures administration, by H11; as to specifications and tolerances for commercial weighing and measuring devices, by M85. Methods for testing commercial weighing and measuring devices will be treated in a future publication.

INDEX TO THE REPORTS OF THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES, FROM THE FIRST (1905) TO THE TWENTY-FIRST (1928), INCLUSIVE

NOTES.—Citation to particular conference reports and to the places in such reports where the desired information may be located, are given in the following manner: The number of the conference report is given first, in bold-face type, followed by the number, in ordinary type, of the page on which the reference begins. Thus **20**, 87, would indicate that the material desired would be found beginning on page 87 of the report of the twentieth conference. When material carries over from one session of a conference to the next session, a new reference is given.

For information as to how copies of the conference reports may be procured or consulted and for the designation of the several conference reports according to the numeration followed in the bureau's series of publications, reference should be made to pages 1, 3, and 4 of this publication.

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EARLY PUBLICATIONS RELATING TO THE HISTORY OF WEIGHTS AND MEASURES STANDARDS IN THE UNITED STATES

NOTE.—In Miscellaneous Publication of the Bureau of Standards No. 64, History of the Standard Weights and Measures of the United States, will be found a unified and relatively brief presentation of that subject. For those wishing to make a more detailed study along this line, the following list of references to original sources has been prepared; these references have been selected almost entirely from a bibliography on standard weights and measures published in 1898 by the United States Coast and Geodetic Survey.

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Letter from the Secretary of the Treasury transmitting report of F. R. Hassler on standards of weights and measures, July 3, 1838. [House Doc. No. 454, 25th Cong., 2d sess.]

Report of F. R. Hassler as superintendent of construction of standards of weight and measure, November 14, 1838. [Forms part of Senate Doc. No. 4, 25th Cong., 3d sess.]

Upon the construction of standards of weights and measures, November 16, 1839. [Forms part of Senate Doc. No. 15 and of House Doc. No. 20, 26th Cong., 1st sess.]

Report of F. R. Hassler, superintendent of weights and measures, on completion of standard yard measures, July 10, 1840. [House Doc. No. 261, 26th Cong., 1st sess.]

Upon the construction of standard weights and measures, November 17, 1840. [Forms part of House Doc. No. 14, 26th Cong., 2d sess.]

Report of F. R. Hassler, superintendent of weights and measures, on completion of standard ounce weights, June 22, 1841. [House Doc. No. 33, 27th Cong., 1st sess.]

Report on construction of liquid-capacity standards, April 5, 1842. [Senate Doc. No. 225 and House Doc. No. 176, 27th Cong., 2d sess.]

Report of Committee on Commerce on adoption of metric system of weights and measures, March 2, 1843. [House Report No. 285, 27th Cong., 3d sess.]

Reports of F. R. Hassler as superintendent of construction of standards of weight and measure, April, June, and November, 1843, and January, 1844. [House Doc. No. 94, 28th Cong., 1st sess.]

Report of Alexander D. Bache, superintendent of weights and measures, on construction of standard weights, measures, and balances, February, 1845. [Senate Doc. No. 149 and House Doc. No. 159, 28th Cong., 2d sess.]

Reports of Alexander D. Bache, superintendent of weights and measures, on construction of standard weights, measures, and balances, April 25 and August 7, 1846. [Senate Doc. No. 483, 29th Cong., 1st sess.]

Reports of Alexander D. Bache, superintendent of weights and measures, on constructlon of standard weights, measures, and balances, July 30 and August 12, 1848. [Senate Ex. Doc. No. 73 and House Ex. Doc. No. 84, 30th Cong., 1st sess.]

Report of Alexander D. Bache, superintendent of weights and measures, on construction and distribution of standard weights, measures, and balances, December 31, 1856. [Senate Ex. Doc. No. 27, 34th Cong., 3d sess.]

Report of the Secretary of the Treasury on the weights and measures furnished the States and their cost, December 15, 1858. [Senate Ex. Doc. No. 6, 35th Cong., 2d sess.]

Report of Mr. Kasson of the Committee on Coinage, Weights, and Measures, on a uniform system of weights and measures, May 17, 1866. [House Report No. 62, 39th Cong., 1st sess.]

Relation of standards of measure of United States to those of Great Britain and France, by J. E. Hilgard, assistant, United States Coast Survey, 1876. [App. No. 22 to U. S. Coast Survey Report for 1876.]

Comparison of American and British standard yards, by J. E. Hilgard, assistant, United States Coast Survey, 1877. [App. No. 12 to U. S. Coast Survey Report for 1877.]

Letters of C. P. Patterson, superintendent, and J. E. Hilgard, assistant, United States Coast Survey, on obligatory use of metric system of weights and measures, March 1878. [House Ex. Doc. No. 71, 45th Cong., 2d sess.]

Statement of J. E. Hilgard, assistant, United States Coast Survey, on standard weights and measures of the United States, May 8, 1878. [House Mis. Doc. No. 61, 45th Cong., 2d sess.]

Papers relative to the convention establishing the International Bureau of Weights and Measures, June 11, 1878. [House Ex. Doc. No. 96, 45th Cong., 2d sess.]

Report of Mr. Vance of the Committee on Coinage, Weights, and Measures, on a decimal system of weights and measures, March 5, 1880. [House Mis. Doc. No. 29, 46th Cong., 2d sess.]

Letter of F. M. Thorn, superintendent, United States Coast and Geodetic Survey, relating to supplying standard weights, measures, and balances to States and Territories, January, 1886. [Senate Ex. Doc. No. 55, 49th Cong., 1st sess.]

Verification of Weights and Measures, by O. H. Tittmann, assistant, United States Coast and Geodetic Survey, November 30, 1889. [Coast and Geodetic Survey Bulletin No. 15, 1889.]

On the relation of the yard to the metre, by O. H. Tittmann, assistant, United States Coast and Geodetic Survey. [App. No. 16, Annual Report of the U. S. Coast and Geodetic Survey, 1890, being a republication, with additions, of a paper first published as U. S. Coast and Geodetic Survey Bulletin No. 9.]

Historical account of United States standards of weight and measure, compiled by O. H. Tittmann, assistant in charge of the Office of Standard Weights and Measures of the United States Coast and Geodetic Survey, May 6, 1890. [App. No. 18, Annual Report of the U. S. Coast and Geodetic Survey, 1890.]

Fundamental Standards of Length and Mass, by T. C. Mendenhall, superintendent of standard weights and measures, April 5, 1893. [App. No. 6, Annual Report of the U. S. Coast and Geodetic Survey, 1890, having been first published as U. S. Coast and Geodetic Survey Bulletin No. 26.]

BOOKS RELATING TO THE SUBJECT OF WEIGHTS AND MEASURES, BY OUTSIDE AUTHORS

NOTE.—The following short list of weights and measures books has been selected from the limited literature on this subject, as comprising those most apt to interest American weights and measures officials, manufacturers, and students. No publications in a foreign language have been included, nor is the list inclusive of all books on the subject printed in English.

British Weights and Measures, by C. M. Watson. 1910. A history of British weights and measures as described in the laws of England from Anglo-Saxon times. Published by John Murray, London, England.

Construction of the Balance, by E. Brauer. Third edition, 1909. (Revised by Fr. Lawaczeck, and translated by Henry C. Walters. "According to underlying principles and according to its special purpose. For use by manufacturers of weighing instruments as also for technical colleges and schools." Published by the Incorporated Society of Inspectors of Weights and Measures. (Address: Secretary, Weights and Measures Office, Council House, Coventry, England.)

Conversion Tables of Foreign Weights, Measures, and Moneys, by John J. Macfarlane. Seventh edition, 1924. Published by the Foreign Trade Bureau, Philadelphia Commercial Museum, Philadelphia, Pa.

Early Weights and Measures of Mankind, by Charles Warren. 1913. Published by the Committee of the Palestine Exploration Fund, London, England.

Evolution of Weights and Measures and the Metric System, by William Hallock and Herbert T. Wade. 1906. "It has been the aim of the authors to present in simple and nontechnical language, so far as possible, a comprehensive view of the evolution of the science of metrology as it is now understood." Published by the Macmillan Co., New York, N. Y.

Historical Essays, by William Robertson. 1872. Standards of the past in weight and currency, land measurements, etc. Published by Edmonston and Douglas, Edinburgh, Scotland.

Men and Measures, by Edward Nicholson. 1912. "A history of weights and measures, ancient and modern." Published by Smith, Elder & Co., London, England.

Modern Metrology, by Lowis D'A. Jackson. 1882. "A manual of the metrical units and systems of the present century." Published by Crosby Lockwood & Co., London, England.

Our Weights and Measures, by H. J. Chaney. 1897. "A practical treatise on the standard weights and measures in use in the British Empire * * *." Published by Eyre & Spottiswoode, London, England.

Scales and Weighing, by Herbert T. Wade. 1924. "Deals with the many forms of weighing equipment now available for industrial and commercial use and the ways in which they are utilized by well-organized concerns to secure operation at a profit." Published by the Ronald Press Co., New York, N. Y.

Statesman's Yearbook. Condensed information, including data on weights and measures, for all countries. Published annually by Macmillan & Co. (Ltd.), London, England.

Tate's Modern Cambist, by H. T. Easton. 1921. "A manual of foreign exchanges and bullion with the monetary systems of the world and foreign weights and measures * * *." Published by Effingham Wilson, London, England.

Treatise on Weighing Machines, by George A. Owen. 1922. "A guide to the principles underlying the construction of weighing machines." Published by Charles Griffin & Co., London, England.

Weights and Measures, by James Roberts. Third edition, 1908. "Being the weights and measures acts 1878 to 1904; the board of trade regulations, 1907; statutory provisions relating to the sale or checking of various commodities by weight or measure; together with the principles of weighing and measuring." Published by Charles Knight & Co. (Ltd.), London, England.

WEIGHTS AND MEASURES PERIODICALS

United States:

Scale Journal (monthly). Published by the Scale Journal Publishing Co. Editor: J. A. Schmitz, 309 South La Salle Street, Chicago, Ill.

Michigan Sealers' Bulletin (bimonthly). Published by the Michigan State, County, and City Sealers' Association. Editor: Will McGillivray, Oscoda, Mich.

Weights and Measures News (monthly).[1] Published by the New York State Association of Sealers of Weights and Measures. Editor: A. W. Corwin, Wellsville, N. Y.

Great Britain:

Monthly Review (monthly). Published by the Incorporated Society of Inspectors of Weights and Measures. Editor: G. A. Owen, weights and measures office, Council House, Smethwick, England.

Automatic World and Scale Trades Review (monthly). Address: 2, Wine Office Court, Fleet Street, London E. C. 4, England.

France:

Review de Métrologie Pratique (monthly). Publisher and Editor: Adrien Roux, 10 Quai des Célestins, Paris, France. (This periodical is in the French language.)

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[1] Publication of this periodical was temporarily discontinued with the issue of June, 1929.

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